## What is claimed is:

- An oligonucleotide having the sequence of SEQ ID NO:1 or which is substantially identical thereto.
- 2. An oligonucleotide having the sequence of SEQ ID NO:2 or which is substantially identical thereto.
- 3. An oligonucleotide having the sequence of SEQ ID NO:7 or which is substantially identically thereto.
- 4. An oligonucleotide having the sequence of SEQ ID NO:8 or which is substantially identically thereto.
- 5. A kit for detecting expression of a Dihydropyrimidine dehydrogenase (*DPD*) gene in a tissue obtained from a patient comprising oligonucleotide pair DPD3A or a pair of oligonucleotides substantially identical thereto or oligonucleotide pair DPD3B or a pair of oligonucleotides substantially identical thereto.
- 6. A method of determining the relative level of Dihydropyrimidine dehydrogenase (DPD) gene expression in a tissue sample comprising:
  - (a) obtaining a tumor sample from a patient;
  - (b) isolating mRNA from said umor sample;



## SUB AA CON'X.

- amplifying the mRNA using an oligonucleotide primer having the sequence of SEQ ID: 1, or which is substantially identical thereto and an oligonucleotide having the sequence SEQ ID: 2, or which is substantially identical thereto;
- (d) comparing the amount of Dihydropyrimidine dehydrogenase (*DPD*) mRNA from step (c) to an amount of mRNA of an internal control gene.
- 7. The method of claim 6, wherein the tumor sample is frozen after being obtained from the patient.
- 8. The method of claim 6, wherein the tumor sample is fixed after being obtained from the patient.
- 9. The method of claim 8, wherein the tumor sample is embedded in paraffin fixed after being fixed.
- 10. The method of claim 8 or 9, wherein the RNA is isolated in the presence of an effective amount of chaotropic agent.
- 11. The method of any one of claims 6, 8, or 9, wherein the tumor sample comprises non-tumor tissue and tumor tissue.
- 12. A method for determining a 5-Flyorburacil-based chemotherapeutic regimen

for treating a tymor in patient comprising:

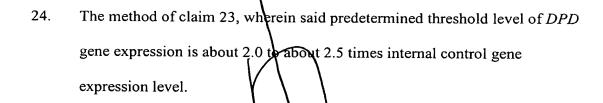
- (a) obtaining a tumor sample from the patient;
- (b) isolating nRNA from said tumor sample;
- subjecting the mRNA to amplification using a pair of oligonucleotide primers having the sequence of SEQ ID: 1, or which is substantially identical thereto and an oligonucleotide having the sequence SEQ ID: 2, or which is substantially identical thereto to obtain an amplified sample,
- (d) determining the amount of Dihydropyrimidine dehydrogenase (*DPD*) mRNA in the amplified sample;
- (e) comparing the amount of Dihydropyrimidine dehydrogenase (*DPD*)

  mRNA in the amplified sample with a predetermined threshold level for *DPD* expression;
- (f) determining a 5-Fludrouracil-based chemotherapeutic regimen for said patient based on the difference in amount of *DPD* mRNA in the amplified sample and the threshold level for *DPD* gene expression.
- 13. The method of claim 12, wherein said predetermined threshold level of *DPD* gene expression is about 2.0 to about 2.5 times internal control gene expression level.
- 14. The method of claim 12 or 13, wherein said internal control gene is  $\beta$ -actin.
- 15. The method of claim 13, wherein the tumor sample is fixed and embedded

after being obtained.

- 16. The method of claim 13, wherein the mRNA is isolated in the presence of an effective amount of claotropic agent.
- 17. A method of determining the relative level of Dihydropyrimidine dehydrogenase (DRD) gene expression in a tissue sample comprising;
  - (a) obtaining a turnor sample from a patient;
  - (b) isolating mRNA from said tumor sample;
  - amplifying the mRNA using an oligonucleotide primer having the sequence of SEQ ID: 1, or which is substantially identical thereto and an oligonucleotide having the sequence SEQ ID: 8, or which is substantially identical thereto;
  - (d) comparing the amount of the mRNA from step (c) to an amount of mRNA of an internal control.
- 18. The method of claim 17, wherein the tumor sample is frozen after being obtained from the patient.
- 19. The method of claim 17, wherein the a tumor sample is embedded in paraffin fixed after being fixed.
- 20. The method of claim 19, wherein the mRNA is isolated in the presence of an effective amount of chaotropic agent.

- 21. The method of claim 17 wherein the tissue sample is obtained from a tumor.
- 22. The method of claim 20, wherein a tumor sample comprises non-tumor tissue and tumor tissue.
- 23. A method for determining a 5-Fluorouracil-based chemotherapeutic regimen for treating a tumor in a patient comprising:
  - (a) obtaining a tumor sample from the tumor;
  - (b) isolating mRNA from a tumor sample;
  - subjecting the mRNA to amplification using a pair of oligonucleotide primers having of the sequence of SEQ ID: 7, or which is substantially identical thereto and an oligonucleotide having the sequence SEQ ID: 8, or which is substantially identical thereto, to obtain an amplified sample;
  - (d) determining the amount of Dihydropyrimidine dehydrogenase (*DPD*) mRNA in the amplified sample;
  - (e) comparing the amount of Dihydropyrimidine dehydrogenase (*DPD*) mRNA in the amplified sample with a predetermined threshold level for *DPD* expression;
  - (f) determining a 5-Fluorouracil-based chemotherapeutic regimen for said patient based on the difference in amount of *DPD* mRNA in the amplified sample and the threshold level for *DPD* gene expression.



25. The method of claim 23, or 24, wherein said internal control gene is  $\beta$ -actin.

26. The method of any one of claims 5, 6, 12, 17, or 23; wherein the at least one tissue sample contains bronchoalveolar tumor tissue, small bowel tumor tissue or colon tumor tissue.